

THE ROLE OF MATHEMATICS IN PHYSICS

by

C. S. SHARMA

Department of Mathematics, Birkbeck College, University of London.

Abstract. An attempt has been made to present a working philosophy of mathematics and its application in physics with the aim of removing the conflicts which have damaged, by slowing down, the progress of both mathematics and physics. Mathematics is defined to be mainly the study of abstract structures, where by structure we mean the relationships between the constituent parts of a whole and by abstract we mean the essence abstracted from reality. Those mathematical structures which have no known counterpart in reality are called abstruse structures. The role of mathematics in physics is primarily to provide abstract structures which can serve as approximate models for actual physical structures. The roles of such models in improving our understanding of the physical reality and as heuristic tools in making speculative predictions are explained. Though the main contention of this work is that physicists should modernize their knowledge of mathematics, it is denied that there exists a modern mathematics which is opposed to classical mathematics.